THE NEED FOR AN IMPROVED DRIVE SYSTEM

Joint reliability, worker safety, downtime, product quality - all are affected by the drive system you select for your assembly line.

There are many drive systems available today. But because of weaknesses inherent in their design, they may cause problems on the assembly line and in the field.

SLOTTED SYSTEMS
- Tool slippage is common, which can cause damage to surrounding surfaces
- Drive tools tend to chip or round off at corners
- Not compatible with automated assembly

HEX SYSTEMS
- Point-to-surface contact between hex drive tool and fastener head often leads to rapid tool wear and can distort the fastener head as torque increases
- 60° drive angle is inefficient for torque transfer
- Stress is concentrated at corners of hex socket, which can cause the socket to fail at these stress points
- Diameter of the hex drive socket is normally greater than the bearing surface of fastener, forcing engineers to design for socket clearance

12-point Drive
- Since the 12-point drive is simply a double hex drive, the problems of point-to-surface contact, inefficient 60° drive angle and stress risers still exist

CRUCIFORM SYSTEMS
- Inclined side walls of the cruciform drive deflect torque upwards which causes the driver to “camout”
- Camout and its limits on torque transfer can prevent a fastener from being fully seated
- Excessive end loads, required to prevent camout, can reduce bit life and cause worker fatigue and injury

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The TORX® Drive System was specifically designed to provide a simple, cost-effective solution to the problems inherent in the process of installing and removing fasteners. Used in a multitude of industries, the TORX Drive System can enhance product reliability, increase productivity, and reduce total assembly costs — all of which are keys to remaining competitive in today’s marketplace.

15° Drive Angle
• Provides high torque transfer
• Radial forces are drastically reduced, resulting in a longer tool life

Straight, Vertical Sidewalls
• Increases tool engagement
• Unlike cruciform drive systems, no camout forces are created to push the driver up and out of the fastener
• Since camout is virtually eliminated, little or no end load is required
• Ergonomic studies have shown the TORX Drive System can reduce fatigue and muscular stress during the manual assembly of fasteners
• Recess completely encloses drive bit, minimizing tool slippage and the damage and injuries it can cause

Broad Contact Surface
• Provides greater depth of lobe engagement between the driver and the fastener
• Allows driving forces to spread over a broader surface, as opposed to the point contact of many drive systems
• Allows more efficient torque transfer
• Extends tool life

Inch and Metric in One Drive Tool
• Same-sized drive tool seats both inch- and metric-sized fasteners
• Add or convert to metrics later without a tooling change
VARIATIONS OF THE TORX® DRIVE SYSTEM

EXTERNAL TO RX® DRIVE
• Provides an excellent alternative to hex or 12-point drives
• External TO RX sockets are smaller in diameter than standard hex sockets used for the same-size fastener
• Provides greater flexibility when designing for drive socket clearance

AUDITORX® AND TAMPER-RESISTANT AUDITORX DRIVES
Automatic torque monitoring is made possible by the AUDITORX® Drive head which is designed to break off at a pre-determined torque level.
• The standard AUDITORX Drive leaves a standard hex drive for later field service
• The tamper-resistant AUDITORX fastener leaves a rivet-like head to prevent removal

DUAL DRIVE SYSTEMS
The TORX Drive System can be combined with either an external hex or a slot to provide a dual drive system.
• Provides the option of driving or removing the fastener with commonly available TORX tools or with a hex socket or slotted screwdriver
• Slotted TO RX recess has a slot which is enclosed at the ends, so the driver is less likely to slip out and damage surrounding surfaces

TO RXSTEM® DOUBLE-END STUDS
Since most double end studs lack a drive system, it is necessary to grip the threaded portion of the stud in order to drive it, which can result in thread damage. A special external TO RX configuration extruded onto one end of the TO RXSTEM® double end stud simplifies driving.
• TO RXSTEM studs are installed using a TO RX socket to increase productivity and reduce thread damage and rework

TAMPER-RESISTANT TO RX DRIVE
This unique TO RX variation incorporates a solid post formed in the center of the recess during the heading process.
• When combined with a countersunk or button head design, the fastener is extremely difficult to remove without a special tamper-resistant TO RX Drive tool.
• Unlike some other tamper-resistant fasteners, installation on the production line is easy with the proper tool

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### Internal & External TORX® Drive Selection Guides

#### Internal TORX® Drive System Standard Drive Size Selection

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#### External TORX® Drive System Standard Drive Size Selection

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For information on styles and sizes not shown here, please contact Textron Fastening Systems.
Around the world, the TORX® Drive System is recognized as one of the most efficient fastening systems available, because of its ability to transfer greater torque, reduce end load and virtually eliminate tool slippage. However, this international acceptance has fostered look-alike TORX fasteners and drivers that frequently don’t meet the quality and performance specifications of authentic TORX Drive products.

**Don’t Let Your Assembly Line Suffer From Look-Alike TORX Products**

The look-alike TORX fasteners and drivers, commonly called “six-lobe” or “Type X”, may be made of inferior material and cause substandard engagement, reaming and damaging of the recess and premature tool wear. This usually leads to serious assembly line problems and costly rework.

To avoid being fooled into a costly mistake, specify only authentic TORX Drive System products from licensed manufacturers.

For further assurance you are getting authentic TORX Drive products, the “TORX” name appears on product sizes T15 and larger for easy identification of authentic TORX fasteners and tools.

**Authentic TORX Drive System Manufacturers**

The TORX Drive System has a global network of licensed manufacturers who provide quality-assured, authentic TORX Drive products around the world. This licensing network ensures that each authentic TORX fastener and driver is made with proprietary tooling that has undergone precise dimensional inspection, and is engineered to function together properly.

The authentic TORX fasteners and drivers themselves are manufactured to very critical, proprietary tolerances, with gaging that is available only to licensed TORX Drive manufacturers.
Converting to the TORX® Drive System has produced quantifiable benefits for many companies including increased productivity, reduced rework, improved working conditions, and lower tooling costs.

**Inch and Metric in One Drive Tool**

An important benefit of the TORX Drive System is that the same size TORX driver is used on both inch and metric fasteners. You can change to the TORX Drive now, and with no additional tool changes, convert to metrics later.

**TORXALIGN® Drive Tool**

The special TORXALIGN bit is designed with a slight taper to provide a wedging effect when the bit is inserted into the fastener recess. This is particularly useful in holding non-magnetic fasteners on the driver during manual installation.

**Tool Availability**

The worldwide acceptance of the TORX Drive System has made the procurement of drive tools easy. TORX tools are readily available from thousands of retail and industrial outlets around the world. A large number of licensed distributors carry TORX sockets and standard bits in lengths from 1" to 6". TORX bits are also available for pneumatic and automatic assembly equipment, while TORX key sets can provide a convenient solution to field serviceability. TORX screwdrivers are readily available to the consumer through most hardware store chains, as well as through catalog merchants and online stores.

For more information on the TORX® Drive System, please contact:

**TEXTRON Fastening Systems**

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